

(19)



Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number:

0 017 639
B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication of patent specification: **13.10.82**

(51) Int. Cl.³: **A 01 N 59/12**

(21) Application number: **80850042.5**

(22) Date of filing: **27.03.80**

(54) **Udder disinfectant and method of disinfecting teats.**

(30) Priority: **02.04.79 SE 7902893**

(43) Date of publication of application:
15.10.80 Bulletin 80/21

(45) Publication of the grant of the patent:
13.10.82 Bulletin 82/41

(84) Designated Contracting States:
AT BE CH DE FR GB IT LU NL SE

(56) References cited:
AT - B - 318 151
FR - A - 2 105 141
GB - A - 1 144 637

The file contains technical information submitted
after the application was filed and not included in
this specification

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Courier Press, Leamington Spa, England.

EP 0 017 639 B1

Udder disinfectant and method of disinfecting teats

DESCRIPTION

TECHNICAL FIELD

The present invention relates to an udder disinfecting preparation comprising a iodophor in the form of an alkylphenoxypoly(ethyleneoxy)ethanol-iodine complex or a polyvinylpyrrolidone-iodine complex.

An object of the present invention is to obtain a iodophorous udder disinfecting preparation which does not cause teat chaps even at repeated daily use on the teats of milkcows, and comprising a complex of iodine with a nonionic surface active agent, and thereby having an improved skin emollient and bactericidal effect.

BACKGROUND OF THE INVENTION

Iodophors in which a part of or the whole amount of elementary iodine is in complex form with a nonionic surface active agent are commonly used in disinfecting preparations within the dairy industry. They are especially used for dipping the teats into after milking has taken place in order to prevent the formation of mastitis.

There are previously known udder disinfecting preparations comprising a iodophor in the form of a complex between iodine and nonionic surface active agents, as a complex between iodine and alkylphenoxypoly(ethyleneoxy)ethanol, and iodine and alkoxyated lanoline, whereby the latter has a skin moistening effect as well, by the effect of the lanoline. Above complexes are described in Swedish patent specifications 145,966 and 357,886.

A continuous use of iodophorous disinfecting preparations without skin emollient features has resulted in a high frequency of chap formation in the teats. The chaps or fissures in the cutaneous tissue of the cow's teats will act as reservoirs for bacteria and it is difficult to penetrate these reservoirs with any type of aqueous disinfecting preparations. It is supposed that the dermatological changes causing chaps depend on the removal of the natural protecting fats of the skin by an emulgating process.

Although iodophorous preparations have a high bactericidal activity a number of them show the drawback that large amounts of ethoxylated surface active agents are needed to give a complete dissolution of their contents of elementary iodine. It is known that only about 20% of the iodine added are chemically bound to the surface active agent, the residue being titratable with standard solutions of sodium thiosulphate. A high amount of nonionic surface active agents in a conventional iodophorous preparation has, however, strongly defatting properties on the skin. Free, elementary iodine is etching the skin, as well.

It is known through French Patent Specification 2.029.396 (69.01620) to prepare a iodophorous preparation to be used in disinfecting dairies, breweries, and wine industries whereby an alkylphenoxypoly(ethyleneoxy)ethanol is absorbed on urea, and sulfamic acid. Such a dry product containing 0.25% free iodine is diluted 100 times with water prior to use i.e. to a content of 0.0025% free iodine. Such a solution will, however, not give a sufficient bactericidal effect in disinfecting teats on udders.

DISCLOSURE OF THE PRESENT INVENTION

It has now surprisingly been shown that it is possible to obtain over the prior art an improved udder disinfecting preparation according to the present invention, which preparation is characterized in that it in a ready-to-use form contains an alkylphenoxypoly(ethyleneoxy)ethanol iodine complex or a polyvinylpyrrolidone iodine complex in an amount corresponding to at least 0.01%, preferably 0.1 to 0.4%, by weight of free iodine, at least 0.04% by weight of a nonionic surface active agent, 5—10% by weight of urea, an organic and/or inorganic acid to pH 1 to 5, preferably 1 to 3, more preferably 2.0 to 2.5, and water and/or another solvent to 100% by weight.

According to a preferred embodiment the agent moreover contains an alkoxyated glucose derivative in an amount of up to 4% by weight in a ready-to-use solution, preferably 2.5 to 3.5% by weight.

The alkoxyated glucose derivative is according to a preferred embodiment a propoxylated (10 to 20 moles) methyl glucoside.

Foam reducing agents in the form of a nonionic surface active agent can be added, as well.

A preferred embodiment of the invention is characterized in that the iodine complex is nonylphenoxy(ethyleneoxy)_{m-1}ethanol iodine complex, wherein m is an integer 8 to 10, preferably 9, and that this complex is combined with a nonionic surface active agent, in an amount of at least 0.08% by weight.

Another preferred embodiment of the invention is characterized in that the nonionic surface active agent is nonylphenoxy(ethyleneoxy)_{n-1}ethanol, wherein n is an integer 20 to 40, preferably 30.

A further preferred embodiment of the invention is characterized in that the acid is phosphorous acid, citric acid and/or hydrochloric acid.

According to another preferred embodiment of the invention it is characterized in that the

nonionic surface active agent is present in an amount of up to 2.5% by weight.

Another aspect of the invention relates to a concentrate for the preparation of a iodophorous preparation, which concentrate is characterized in that the concentration of active agents present is up to 5 times as high as the concentration in a ready-to-use solution.

5 A further aspect of the invention relates to a method of disinfecting the udders of milkcows in order to improve milk-production using a iodophor in the form of an alkylphenoxypoly(ethyleneoxy)-ethanol-iodine complex or a polyvinylpyrrolidone-iodine complex, which method is characterized in that the teats of the udder are treated with a dilute solution defined above, and whereby preferably the teats are treated by being dipped in the solution at least once daily during the lactation period, and during at
10 least 2 weeks prior to calving, and whereby more preferably the teats are dipped and covered with 1 to 2 mls of the solution at each dipping occasion.

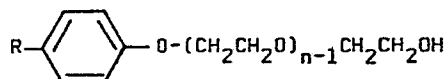
Iodophorous disinfecting preparations can in normal cases have an iodine concentration in the range of 0.4 to 1.0% in a ready-to-use solution. In tests carried out using a concentration of 2% of iodine no cutaneous toxicity has been observed.

15 Most iodophors have a content of nonionic surface active agents of 5 to 25%. If iodine and surface active agent act upon each other in any of these products the reaction velocity is dependent on the concentration of the surface active agent and consequently the manufacturer has to keep the concentration of surface active agent as low as possible to obtain a good stability at the same time as the iodine is solubilized. Such products can be used as disinfectants but their effects as detergents will be low. As the problem of stability has been dissolved it is in this special case possible to produce
20 disinfectants having as high detergent activities as 20 to 25%.

An organic solvent as an alcohol can be present to control the viscosity and to give the product anti-freezing properties in countries where low temperatures are present from time to time.

If higher viscosities are preferred viscosity increasing agents known to the one skilled in the art can
25 be added.

The term alkylphenoxypoly(ethyleneoxy)ethanol is understood to mean compounds of the formula



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wherein R is an alkyl group preferably having 8 to 10 carbon atoms, especially having 9 carbon atoms. When the alkylphenoxypoly(ethyleneoxy)ethanol is part of a complex with iodine n is an integer 8 to 12, preferably 9, whereby the ethyleneoxide amount is 60 to 70%, and when the alkylphenoxypoly-
35 (ethyleneoxy)ethanol is a nonionic surface active agent in order to obtain a phase stabilizing effect at the dilution of a concentrate to a ready-to-use solution, n is an integer 15 to 40, preferably 30, whereby the ethyleneoxide amount is 75 to 90%. An alkylphenoxypoly(ethyleneoxy)ethanol consisting of nonyl-phenoxy(ethyleneoxy)ethanol having 23% ethyleneoxide content can be used as a foam reducer.

The amount of iodine in the iodine complex is about 20% (titratable amount).

40 The amount of iodine in a ready-to-use solution should from a milk contamination point of view not exceed about 0.5% by weight (titratable amount). In the present invention the concentration used is preferably 0.1 to 0.4%, normally 0.25%, of iodine.

From a distributional point of view it is often desired to utilize a concentrate of the iodophorous disinfectant, whereby the concentration of active agent present is up to 5 times as high.

45 The alkoxyated glucose derivative according to the preferred embodiment is present in a concentrated solution in an amount of up to 15% by weight.

The present invention will in the following be described more in detail with reference to the Examples below.

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BEST MODE OF CARRYING OUT THE INVENTION

EXAMPLE 1

		% by weight
5	Antarox [®] VRO 20 (Gaf Corp USA), [nonyl-phenoxypoly(ethyleneoxy)ethanol-iodine complex] 20% free iodine	3.75
10	Gaf [®] CO—880 (Gaf Corp USA) [nonylphenoxy-poly(ethyleneoxy)ethanol]	3.15
15	Glucam [®] P—10 (Amerchol. USA) [propoxylated methylglucoside]	4.5
	Urea	24.0
	Phosphoric acid	2.0
20	Water	62.60
		100.00

The solution prepared is diluted with 2 parts of water prior to teat dipping.

EXAMPLE 2

		% by weight
30	Antarox [®] VRO—20 (Gaf Corp. USA)	3.75
	Gaf [®] CO—880 (Gaf Corp. USA)	3.15
35	Urea	24.00
	Phosphoric acid (87%)	2.0
40	Water	67.10
		100.00

The solution prepared is diluted with 2 parts of water prior to teat dipping.

The iodophor according to Example 1 above was compared with a iodophorous udder disinfectant

45 comprising a lanoline-iodine complex (Ewodip[®]) with regard to bactericidal effect. The ready-to-use solution of Example 1 thereby contained 0.25% by weight of iodine and the agent compared with contained 0.4% by weight of iodine.

The results are shown in the table below where the number of viable microorganisms after 15, 30, and 60 min. have been given.

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Patentansprüche

1. Jodophor-Euterdesinfektionsmittel mit einem Jodophor in der Form eines Alkylphenoxypoly-(äthylenoxy)-äthanol-Jodkomplexes oder eines Polyvinylpyrrolidon-Jodkomplexes, dadurch gekennzeichnet, daß es in einer für die Verwendung fertigen Form den Jodophorkomplex in einer Menge entsprechend wenigstens 0,01, vorzugsweise von 0,1 bis 0,4 Gewichts-% freien Jods, wenigstens 0,04 Gewichts-% eines nichtionischen oberflächenaktiven Mittels, 5 bis 10 Gewichts-% Harnstoff, eine organische und/oder anorganische Säure für einen pH-Wert von 1 bis 5, vorzugsweise von 1 bis 3, stärker bevorzugt von 2,0 bis 2,5, und Wasser und/oder ein anderes Lösungsmittel auf 100 Gewichts-% enthält.
2. Euterdesinfektionsmittel nach Anspruch 1, dadurch gekennzeichnet, daß es außerdem ein alkoxyliertes Glucosederivat in einer Menge in einer für die Verwendung fertigen Lösung von bis zu 4 Gewichts-%, vorzugsweise von 2,5 bis 3,5 Gewichts-% enthält.
3. Jodophorpräparat nach Anspruch 1, dadurch gekennzeichnet, daß der Jodkomplex Nonylphenoxy-(äthylenoxy)_{m-1}-äthanol-Jodkomplex ist, worin m eine ganze Zahl von 8 bis 10, vorzugsweise 9 ist, und daß dieser Komplex mit einem nichtionischen oberflächenaktiven Mittel in einer Menge von wenigstens 0,08 Gewichts-% vereinigt ist.
4. Jodophorpräparat nach Anspruch 3, dadurch gekennzeichnet, daß das oberflächenaktive Mittel Nonylphenoxy-(äthylenoxy)_{n-1}-äthanol ist, worin n eine ganze Zahl von 20 bis 40, vorzugsweise 30 ist.
5. Jodophorpräparat nach Anspruch 1, dadurch gekennzeichnet, daß die Säure Phosphorsäure, Zitronensäure und/oder Chlorwasserstoffsäure ist.
6. Jodophorpräparat nach den Ansprüchen 3 bis 4, dadurch gekennzeichnet, daß das nichtionische oberflächenaktive Mittel in einer Menge von bis zu 2,5 Gewichts-% vorliegt.
7. Jodophorpräparat in konzentrierter Form für die Herstellung eines Jodophorpräparates nach den Ansprüchen 1 bis 7, dadurch gekennzeichnet, daß die Konzentration der enthaltenen aktiven Stoffe bis zu 5 mal so groß wie die Konzentration in einer für die Verwendung fertigen Lösung ist.
8. Verfahren zum Desinfizieren der Euter von Milchkühen zur Verbesserung der Milchproduktion unter Verwendung eines Jodophors in der Form eines Alkylphenoxypoly-(äthylenoxy)-äthanol-Jodkomplexes oder eines Polyvinylpyrrolidon-Jodkomplexes, dadurch gekennzeichnet, daß die Zitzen des Euters mit einer Lösung behandelt werden, die einen Jodophorkomplex in einer Menge entsprechend wenigstens 0,01, vorzugsweise 0,1 bis 0,4 Gewichts-% freien Jods, 5 bis 10 Gewichts-% Harnstoff, eine organische und/oder anorganische Säure für einen pH von 1 bis 5, vorzugsweise von 1 bis 3, stärker bevorzugt von 2,0 bis 2,5, und Wasser und/oder ein anderes Lösungsmittel auf 100 Gewichts-% umfaßt.
9. Verfahren nach Anspruch 8, bei dem die Zitzen derart behandelt werden, daß man sie wenigstens einmal täglich während der Milchbildungsperiode und während wenigstens 2 Wochen vor dem Kalben in die Lösung eintaucht.
10. Verfahren nach Anspruch 8, bei dem die Zitzen eingetaucht und bei jedem Eintauchen mit 1 bis 2 ml der Lösung bedeckt werden.

Revendications

1. Désinfectant iodophore pour mamelles comprenant un iodophore sous la forme d'un complexe d'alkylphénoxypoly(éthylène-oxy)éthanol et d'iode ou d'un complexe de polyvinylpyrrolidone et d'iode, caractérisé en ce que, dans sa forme prête à l'emploi, il contient le complexe iodophore en une quantité correspondant à au moins 0,01, de préférence de 0,1 à 0,4% en poids d'iode libre, au moins 0,04% en poids d'un agent tensioactif nonionique, de 5 à 10% en poids d'urée, un acide organique et/ou minéral jusqu'à pH 1 à 5, de préférence 1 à 3, avantageusement 2,0 à 2,5, et de l'eau et/ou un autre solvant pour complément à 100% en poids.
2. Désinfectant pour mamelles selon la revendication 1, caractérisé en ce qu'il contient en outre un dérivé alcoylé de glucose en une quantité allant jusqu'à 4% en poids, de préférence de 2,5 à 3,5% dans une solution prête à l'emploi.
3. Préparation iodophore selon la revendication 1, caractérisée en ce que le complexe d'iode est un complexe de nonylphénoxy(éthylénoxy)_{m-1}-éthanol et d'iode, dans lequel m est un nombre entier compris entre 8 et 10, de préférence égal à 9, et ce complexe est associé avec un agent tensioactif nonionique, en une quantité d'au moins 0,08% en poids.
4. Préparation iodophore selon la revendication 3, caractérisée en ce que l'agent tensioactif nonionique est le nonylphénoxy(éthylénoxy)_{n-1}-éthanol, dans lequel n est un nombre entier compris entre 20 et 40, de préférence égal à 30.
5. Préparation iodophore selon la revendication 1, caractérisée en ce que l'acide est l'acide phosphorique, l'acide citrique et/ou l'acide chlorhydrique.
6. Préparation iodophore selon l'une des revendications 3 et 4, caractérisée en ce que l'agent tensioactif nonionique est présent en une quantité allant jusqu'à 2,5% en poids.
7. Préparation iodophore sous une forme concentrée pour l'obtention d'une préparation iodophore selon l'une quelconque des revendications 1 à 7, caractérisée en ce que la concentration en

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agents actifs est jusqu'à 5 fois aussi élevée que la concentration dans une solution prête à l'emploi.

8. Procédé de désinfection des mamelles des vaches laitières en vue d'améliorer la production de lait, utilisant un iodophore sous la forme d'un complexe d'alkylphénoxy poly(éthylèneoxy)éthanol et d'iode ou d'un complexe de polyvinylpyrrolidone et d'iode, caractérisé en ce que les trayons des mamelles sont traités avec une solution comprenant un complexe iodophore en une quantité correspondant à au moins 0,01, de préférence de 0,1 à 0,4% en poids d'iode libre, 5 à 10% en poids d'urée, un acide organique et/ou minéral pour donner un pH de 1 à 5, de préférence de 1 à 3, avantageusement de 2,0 à 2,5, et de l'eau et/ou un autre solvant pour complément à 100% en poids.

9. Procédé selon la revendication 8, caractérisé en ce que les trayons sont traités par immersion dans la solution au moins une fois par jour pendant la période de lactation et pendant au moins 2 semaines avant le vêlage.

10. Procédé selon la revendication 8, caractérisé en ce que les trayons sont trempés et recouverts avec 1 à 2 ml de la solution à chaque opération d'immersion.

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